

GREEN RIDGE STATE FOREST

ANNUAL WORK PLAN

DRAFT

FISCAL YEAR 2017

Prepared:	_____	_____
	(Forest Manager)	Date
Reviewed:	_____	_____
	(Regional Manager)	Date
Reviewed:	_____	_____
	(Land Acquisition & Planning)	Date
Approved:	_____	_____
	(Environmental Specialist)	Date

State Forest Annual Work Plan

A. Forest Overview

Includes an over site of the forest; history, size, location, special features, etc.

B. AWP summary

Includes number of sales, total harvest acres, acres by harvest method, estimated harvest volume and other important features for the work to be performed during the next year..

C. Maintenance Projects

Includes boundary maintenance, road maintenance, building maintenance and other such projects.

D. Recreation Projects

Includes projects such as campsite improvements, hunting programs, special recreational activities, ATV and hiking trail maintenance, trail grants, signage, and other projects specific to benefiting recreational users of the forest.

E. Special Projects

Includes activities to gain or maintain third party forest certification, GIS databases, and other such activities.

F. Silvicultural Projects

Includes forest harvesting, prescribed fire programs, fertilization, reforestation, and other such projects. This section must include the following:

Final Silvicultural Activities:

1. Site Map
2. Silvicultural Prescription
3. Stand Data

Review Process:

1. Review Summary
2. Interdisciplinary Team Comments (collective)
3. Advisory Committee Comments
4. Public Comments

G. Watershed Improvement Projects

Includes special projects to enhance water quality, wetland restoration, and other such activities.

H. Ecosystem Restoration Projects

Includes projects to manage exotic invasive species, efforts to restore shale barrens or other natural habitats, and other such activities aimed at improving ecosystems.

I. Monitoring Projects

Includes CFI forest inventories, and other inventory projects being conducted on the forest, watershed monitoring, and other such projects.

J. Operational Management

Include proposed budget specific to the forest.

Forest Overview

Green Ridge State Forest is located in eastern Allegany County. It is the only State Forest located in the Ridge and Valley province. Green Ridge receives the least amount of rainfall in Maryland, averaging 36 inches annually. Consisting of 47,560 acres, Green Ridge is the largest contiguous block of forestland in Maryland within the Chesapeake Bay watershed. It accounts for about 30% of the State Forest System and approximately 12% of all DNR land in Maryland.

The general geographic boundaries of Green Ridge are Town Creek to the west and Sideling Hill Creek to the east. The northern boundary extends to the Mason-Dixon Line. The southern boundary parallels the Potomac River.

Elevations range from 500 feet above sea level on the Potomac River to 2,000 feet on Town Hill.

Three Major highways traverse the forest in an east to west direction: Route 144, Maryland Route 51, and Interstate 68.

In the early 1800's, Richard Caton and William Carroll in partnership owned much of the land that is Green Ridge State Forest today. Richard Caton was the son-in-law to Charles Carroll of Carrollton, a signer of the Declaration of Independence. William Carroll was the grandson of Daniel Carroll of Rock Creek, a framer of the United States Constitution. The land was originally patented from vacant lands during the 1820-1840 period for inclusion into various timber and mining interests, primarily the Town Hill Mining, Manufacturing, and Timber Company. This business venture was financed by the estate of Charles Carroll of Carrollton. The crumbling stone structure known as the Carroll Chimney, part of the steam-powered sawmill built in 1836, is the only known surviving structure of that period.

In the 1880-1912 era, most of the remaining virgin forest was cut and a period of neglect resulted in numerous wildfires. During the early 1900's, the Mertens family of Cumberland attempted to convert the forest into apple orchards and promoted it as "The Largest Apple Orchard in the Universe."

The orchard was subdivided into 10-acre parcels and sold to individuals as investment properties. Five acres of each property parcel was cleared, burned, and planted into apple trees. The remaining five acres had the best trees cut and the poorer trees were left standing. The orchard company went into bankruptcy in 1918. The interests of the corporation were acquired by the State Department of Forestry in 1931.

The first forest management activities at Green Ridge were performed by the Civilian Conservation Corps (CCC) in the 1930's. Their main focus was fire control. Other work consisted of building roads, trails, recreation enhancements, and the management of existing forest for its future timber and wildlife potential.

During World War II, the CCC camp at Fifteen Mile Creek housed German prisoners of war who were required to cut pulpwood in the forest. As the forest grew it became popular with outdoor enthusiasts, especially hunters. It also contributed more and more to the local wood products industry.

Today, Green Ridge is a diverse forest consisting primarily of a 110 year old even-aged mixed oak forest, mixed with a wide variety of age classes resulting from various silviculture activities beginning in the late 1960's.

The oak consists of a variety of species, including black oak, white oak, red oak, scarlet oak, and chestnut oak. Five native pines grow at Green Ridge: white pine, Virginia pine, pitch pine, table-mountain pine, and shortleaf pine. Flowering dogwood, redbud, and serviceberry are common understory trees.

Upland animals found in abundant numbers on the forest are white-tailed deer, fox and gray squirrel, raccoons, red fox, and cottontail rabbits. Other animals include muskrat, beaver, mink, chipmunks, mice, flying squirrels, weasels, skunks, opossums, bobcat, and black bear.

Wild turkey, ruffed grouse, and woodcock are popular game birds on Green Ridge. Other birds include the pileated woodpecker, red-tailed hawk, and the barred owl. A wide variety of neo-tropical migrants and songbirds also occur on the forest.

Wildflowers such as mayapple, coltsfoot, spring beauty, trillium, bloodroot, and spiderwort flourish at Green Ridge.

Green Ridge State Forest

Fiscal Year 2017

AWP Summary

This work plan includes silviculture proposals for a total of 339 managed acres within the 24,414 acre general management zone in which area based sustainable forest management is practiced. Of these managed acres, harvests are proposed. There will be some variation between managed acres and actual harvest acres to provide for various buffers and/or retention areas. Under area based management, the annual target is 200-300 managed acres.

The silviculture proposals within this plan include 231 acres of variable retention harvests for an estimated 607mbf of hardwood.

In addition to the above silviculture projects, other maintenance, recreation, ecosystem restoration, watershed improvement, monitoring, and special projects are included in this plan. Specific projects are described within the following pages.

Maintenance Projects

General Maintenance will continue such as maintaining 100 primitive campsites, hazardous tree removal, pole gate installations as needed, mowing and maintenance of handicap access hunting areas, and general maintenance of headquarters complex, shooting range, and outbuildings.

1. Identify and mark all new acquisition boundaries & re-blaze 20 miles of existing state forest boundary.
2. Continue to maintain 100 primitive camp sites.
3. Continue to maintain public shooting range.
4. Continue to maintain viewsheds on 5 overlooks.
5. Continue to maintain 4 handicap hunter access roads.

Recreation Projects

- 1.** Maintain approximately 60 miles of trails including 50 miles of hiking trails and 12 miles of mountain bike trail.
- 2.** Continue to enhance upland game hunting opportunities by enhancing early successional wildlife habitat at Kirk Orchard, Bull Ring Ranch, Anthony's Ridge, and Kasecamp Bottomlands.
- 3.** Provide 2-4 guided interpretive tours on the forest to share management principles and practices with the public.

SPECIAL PROJECTS

A. New Property Acquisition;

Several significant parcels have recently been acquired as part of GRSF. Including the Lancaster, Wilson, and Slider tracts. These parcels need to be delineated, marked and inventoried in preparation for management planning. Maps and details for these parcels can be found in the following pages.

B. Forest Regeneration Inventory:

A Critical part of achieving long term sustainable forestry is monitoring and measuring the outcomes or responses to the management. Since the Stand delineation and inventory project will be complete during FY2016, these technician resources will be available to focus on inventory of the regeneration and response to management. This work will include collecting regeneration inventory data under the Silvah protocol and all stands will be sampled 3-5 years post regeneration harvest.

C. Continue to Network with Partners:

GRSF is committed to being a “teaching forest” and strives to reconnect people to the land through providing forest management tours for the general public, hosting training sessions and forest resource-based events, service learning projects, and serving as natural laboratory for schools and universities.

1. Maintain working relationship with Garrett College – Forestry classes use forest as training laboratory and implement practices directed by Forest Manager.
2. Maintain working relationship with Allegany College of Maryland-Forestry Program will use GRSF for forestry lab and site for their Summer Harvesting Course. GRSF will provide a site where timber can be extracted as part of harvesting course in return for in-kind services.
3. Continue participation with Appalachian Forest Heritage Area (AFHA) Forest Manager serves as Executive Board member.
4. Continue partnership with the Ridge and Valley Stream Keepers (RVSK). GRSF provides meeting room and shares information in return RVSK monitor water quality in the streams within GRSF.
5. Continue partnership with Wildlife Institute and RGS to work on enhancing early succession wildlife habitat on the forest.
6. Continue to support and collaborate with Volunteer groups to facilitate the spirit of service on the forest and reconnect people to the land.
7. Continue to participate in I&E Programs including Home Ground, Becoming an Outdoors Woman, Natural Resources Careers Camp, etc..

Green Ridge State Forest

Fiscal Year 2017

Silviculture Projects Summary

Proposal Name (mbf) Prescription	Compartment	Managed Ac.	Harvest Ac.	Est
1 Oldtown Orleans Rd VR	52	69	46	147
2. Double Pine Rd VR	1	50	25	84
3. Jacobs Rd VR	16	69	46	147
4. Green Ridge Rd VR	26	43	31	99
5. Oldtown Orleans Rd VR	60	66	41	130
6. Barnes Road TSI	40	42	42	N/A

*Total 339 231 607mbf

Abbreviations for prescriptions:
 TSI Timber Stand Improvement
 VR Variable Retention

Note: Managed acres exceeds 200 acres to allow for some reduction and includes intermediate operations.

Silviculture Proposal Narrative

Proposal Name: Oldtown Orleans Rd

Managed Area: 69 Acres

Harvest Area: 46 Acres

Resource Impact Assessment

Forest Community Types and Development: This is a mixed oak stand within the general forest area. It was salvage thinned in 1991 to remove Gypsy Moth damage and the remaining large oaks are declining and succumbing to mortality. Furthermore it is an overstocked stand. These facts constitute the selection of this stand for regeneration silviculture treatment.

Rare, Threatened and Endangered (RTE) species: There are no known RTE species currently on or impacted by this site.

Habitats and Species of Management Concern: There are no known habitats or species of management concern on this site.

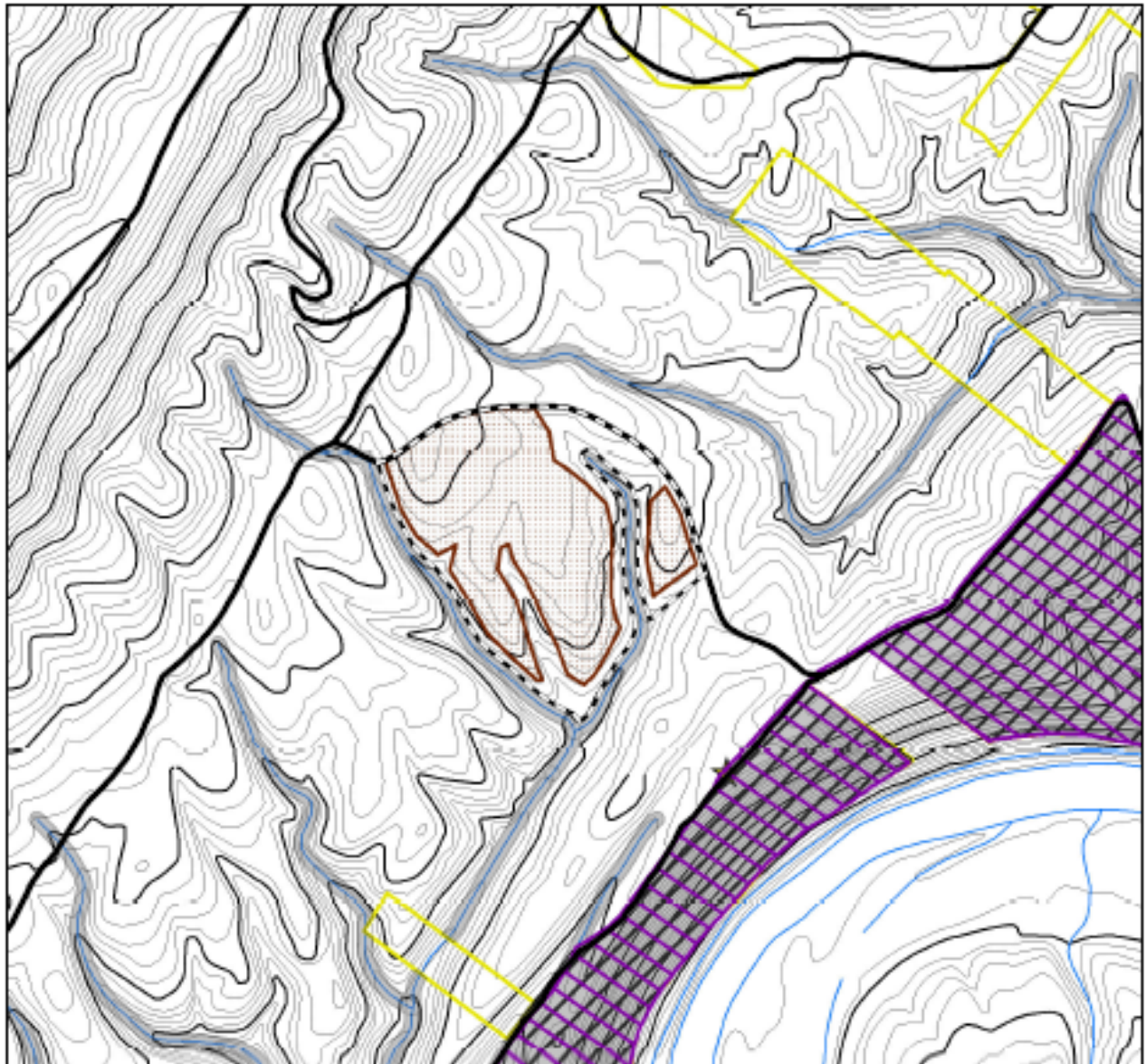
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HCVF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

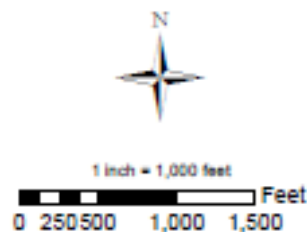
Historic Conditions: This stand like most of GRSF likely developed on its own over the past 92 years into what it is today despite that fact that it was commercially clearcut, and likely the ground was converted to fruit orchard in years prior. Historically this site was likely dominated by American chestnut. However, chestnut blight has eliminated American chestnut from having a dominant position in the landscape.

Silvicultural Prescription: The recommendation for this stand is to regenerate the stand under the principles of variable retention. The objective is to achieve regeneration of a mixed oak stand while maintaining some attributes of the original stand for wildlife habitat, natural heritage, and aesthetics values.

FY-2017 Proposed Harvest Oldtown Orleans Rd



Compartment - 52
 Managed Area - 69 Acres
 Harvest Area - 46 Acres
 Age - 92
 Type - Mixed Oak
 TPA - 250
 AGS - 80 sq. ft.
 Stocking - 101%+
 Growth Rate - <2%
 Soil Type - Klinesville/Lehew
 Site Index - 63
 Composition - SO- 35%
 BO- 26%



Silviculture Proposal Narrative

Proposal Name: Double Pine ESA

Managed Area: 82 Acres

Harvest Area: 27 Acres

Resource Impact Assessment

Forest Community Types and Development: This 82 acre ESA unit includes a series of shale barrens that are buffered by a mature mixed oak stand. This ESA has also been designated as Old Growth Ecological Management Area (OGEMA). In accordance with GRSF Sustainable Forestry Management Plan, This mixed oak stand may be harvested under uneven-aged silviculture principles to enhance the area for Old Growth qualities so long as it does not negatively impact the ESA.

Rare, Threatened and Endangered (RTE) species: *Trifolium virginicum*

Habitats and Species of Management Concern: Shale Barren Community

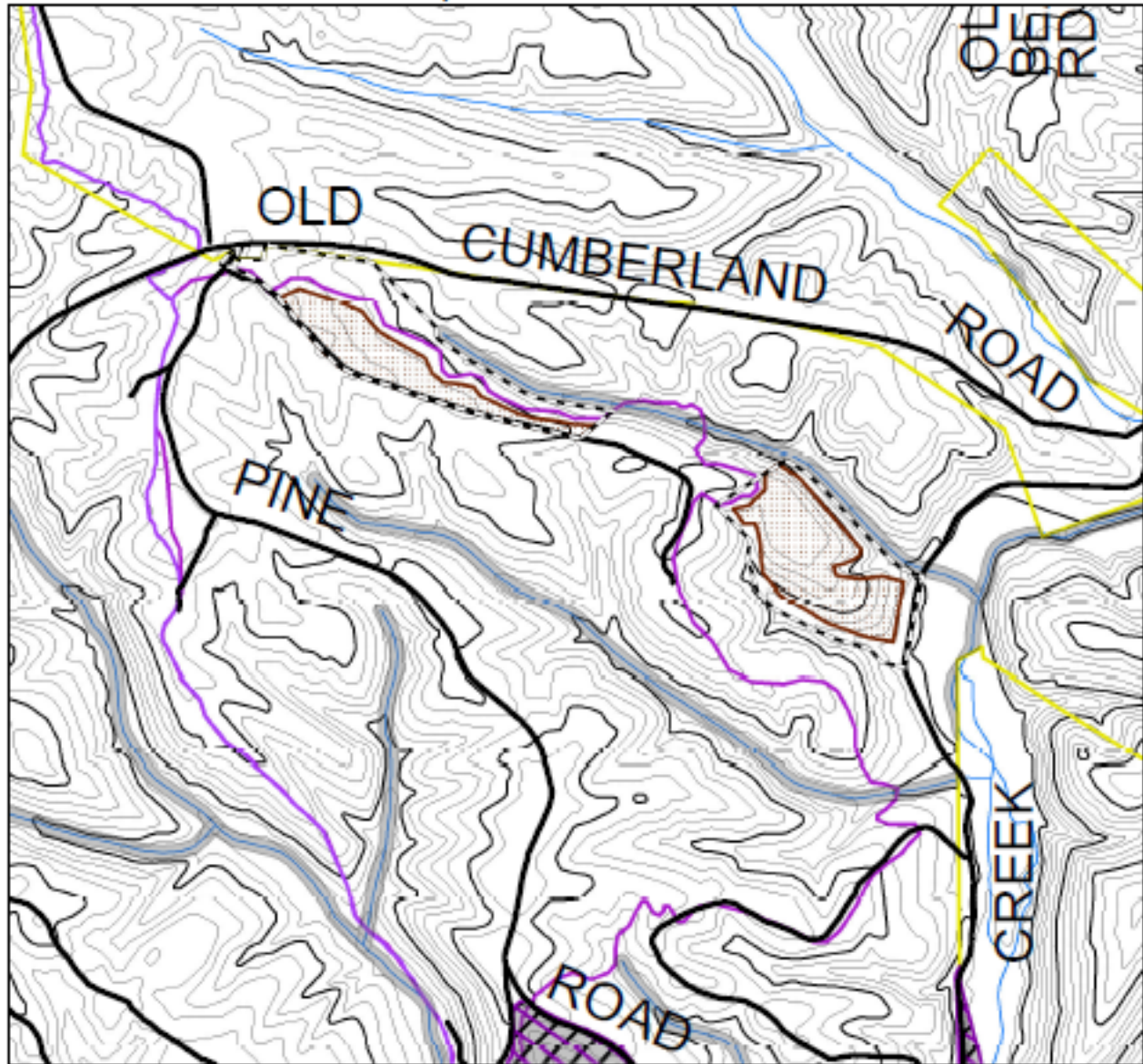
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HCVF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

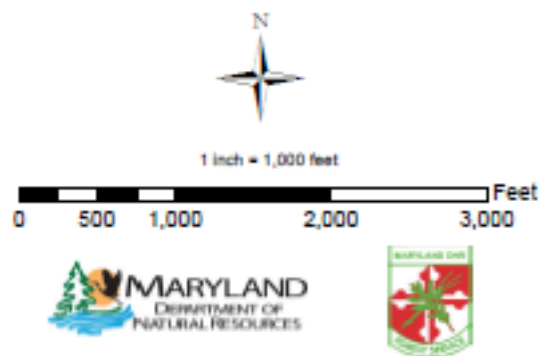
Historic Conditions: This stand like most of GRSF likely developed on its own over the past 110 years into what it is today despite the fact that it was commercially clearcut, and likely the ground was converted to fruit orchard in years prior to approximately 110 years ago. Historically this site was likely dominated by shale barren community adjacent to American chestnut dominated forest. However, Fire suppression programs have disturbed natural fire regimes. Furthermore, chestnut blight has eliminated American chestnut from having a dominant position in the landscape.

Silvicultural Prescription: The recommendation for this ESA is to complete vegetation management within the shale barrens to chemically treat competing woody vegetation growth that has emerged as the result of absence of natural fire regime. It is recommended to follow this herbicide treatment up with prescribed fire within the shale barren units to enhance their ecological condition. Secondly, it is recommended to treat approximately 27 acres of the adjacent mature oak stand through a partial harvest to enhance OGEMA qualities while facilitating the establishment of a burn unit and control lines for the shale barren Rx fire. The objective is to establish a manageable burn unit for enhancing and maintaining the shale barren communities and enhance the adjacent stand for uneven-aged/or over-mature forest qualities. The partial harvest plan within this stand will follow the BMP guidelines for cerulean warbler habitat enhancement and include removing approximately 50% of the basal area.

FY-2017 Proposed Harvest Double Pine



Compartment - 1
 Managed Area - 50 Acres
 Harvest Area - 25 Acres
 Age - 125
 Type - Mixed Oak
 TPA - 237
 AGS - 98 sq. ft.
 Stocking - 111%
 Growth Rate - <2%
 Soil Type - Weikert
 Site Index - 63
 Composition - WO- 71%
 CO- 11%



Legend

- ManagedArea
- Wildlands
- OGEMA
- ESA
- HCVF
- GRSF Boundary
- Hiking Trail

Silviculture Proposal Narrative

Proposal Name: Jacobs Rd

Managed Area: 69 Acres

Harvest Area: 46 Acres

Resource Impact Assessment

Forest Community Types and Development: This is a mixed oak stand within the general forest area. According to the GRSF specified 100 year rotation, this stand is over-mature at 129 years. Furthermore it is an overstocked stand. These facts constitute the selection of this stand for regeneration silviculture treatment.

Rare, Threatened and Endangered (RTE) species: There are no known RTE species currently on or impacted by this site.

Habitats and Species of Management Concern: There are no known habitats or species of management concern on this site.

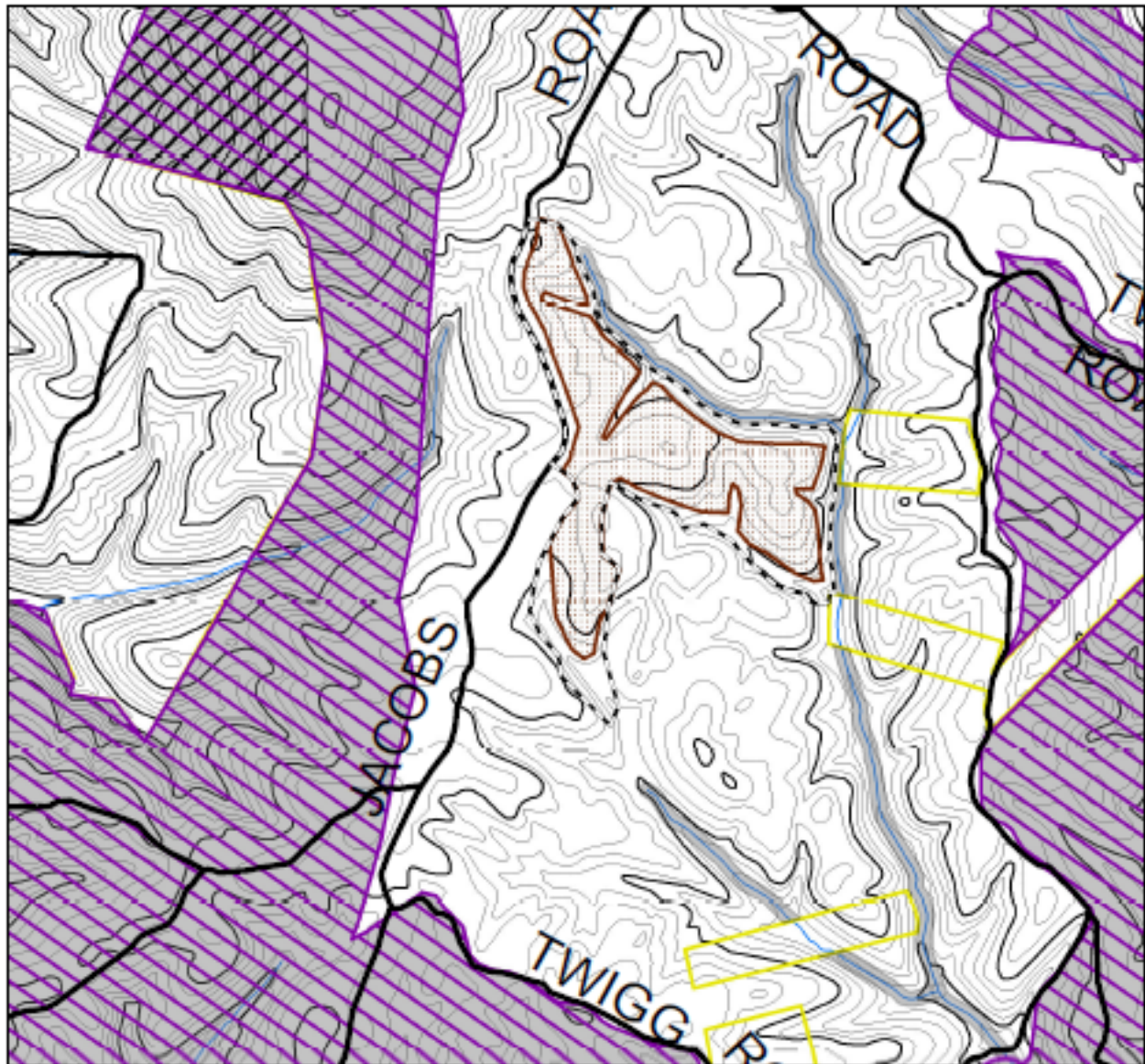
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HCVF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

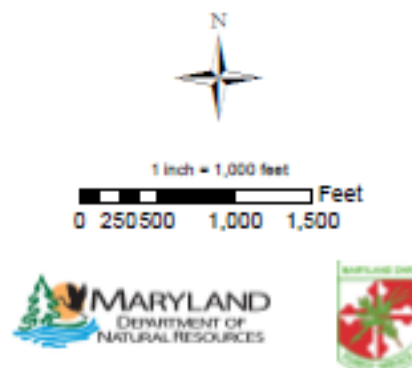
Historic Conditions: This stand like most of GRSF likely developed on its own over the past 129 years into what it is today despite the fact that it was commercially clearcut, and likely the ground was converted to fruit orchard in years prior to 129 years ago. Historically this site was likely dominated by American chestnut. However, chestnut blight has eliminated American chestnut from having a dominant position in the landscape.

Silvicultural Prescription: The recommendation for this stand is to regenerate the stand under the principles of variable retention. The objective is to achieve regeneration of a mixed oak stand while maintaining some attributes of the original stand for wildlife habitat, natural heritage, and aesthetics values.

FY-2017 Proposed Harvest Jacobs Rd



Compartment - 18
 Managed Area - 69 Acres
 Harvest Area - 46 Acres
 Age - 129
 Type - Mixed Oak
 TPA - 178
 AGS - 100 sq. ft.
 Stocking - 101%+
 Growth Rate - <2%
 Soil Type - Weikert
 Site Index - 63
 Composition - WO- 51%
 CO- 27%



Legend

- ManagedArea
- HarvestArea
- Wildlands
- OGEMA
- ESA
- HCVF
- GRSF Boundary

Silviculture Proposal Narrative

Proposal Name: Green Ridge Rd

Managed Area: 43 Acres

Harvest Area: 31 Acres

Resource Impact Assessment

Forest Community Types and Development: This is a mixed oak stand within the general forest area. According to the GRSF specified 100 year rotation, this stand is over-mature at 106 years. Furthermore it is an overstocked stand. These facts constitute the selection of this stand for regeneration silviculture treatment.

Rare, Threatened and Endangered (RTE) species: There are no known RTE species currently on or impacted by this site.

Habitats and Species of Management Concern: There are no known habitats or species of management concern on this site.

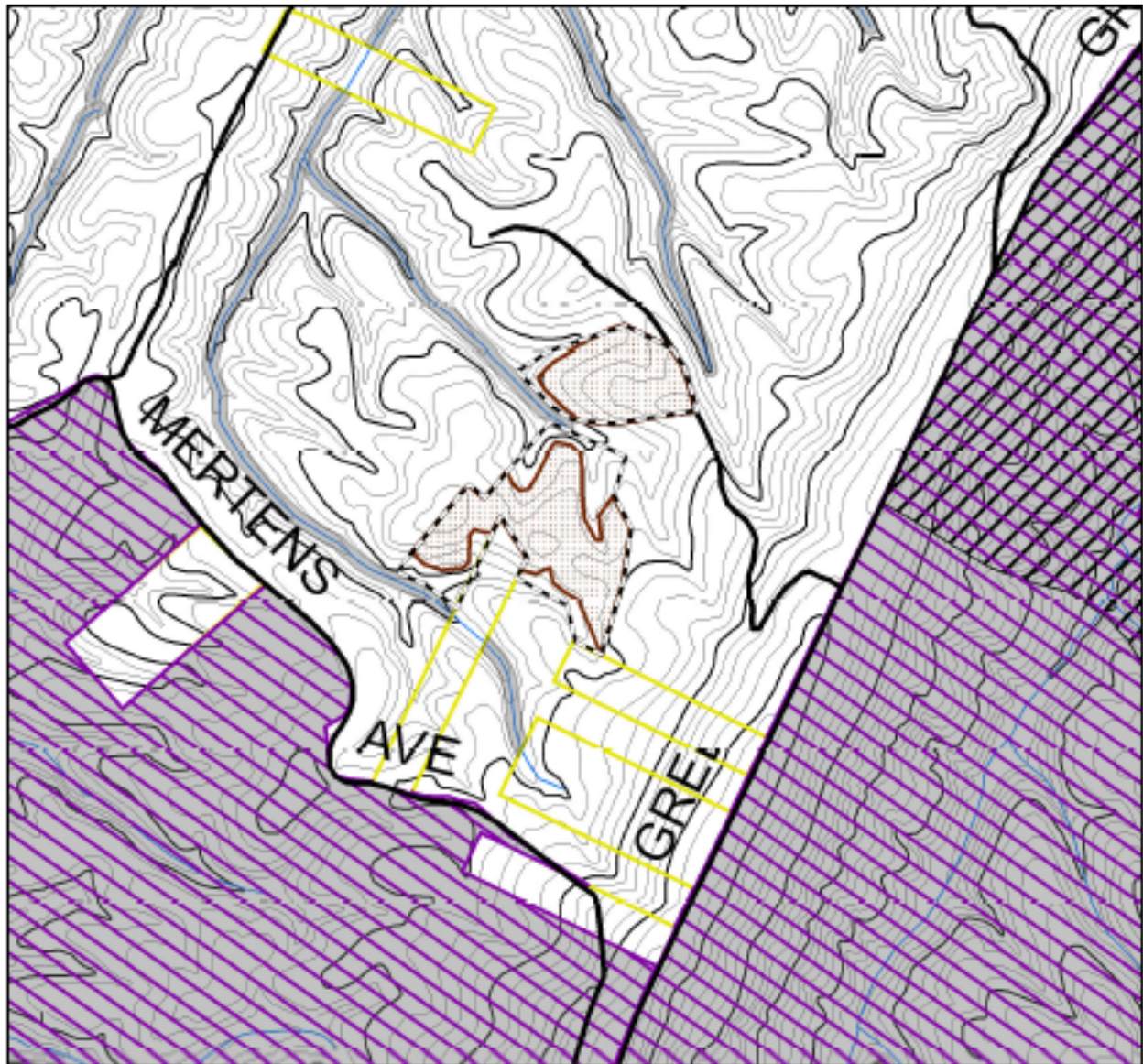
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HCVF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

Historic Conditions: This stand like most of GRSF likely developed on its own over the past 106 years into what it is today despite the fact that it was commercially clearcut, and likely the ground was converted to fruit orchard in years prior to 106 years ago. Historically this site was likely dominated by American chestnut. However, chestnut blight has eliminated American chestnut from having a dominant position in the landscape.

Silvicultural Prescription: The recommendation for this stand is to regenerate the stand under the principles of variable retention. The objective is to achieve regeneration of a mixed oak stand while maintaining some attributes of the original stand for wildlife habitat, natural heritage, and aesthetics values.

FY-2017 Proposed Harvest Green Ridge Rd



Compartment - 26
 Managed Area - 43 Acres
 Harvest Area - 31 Acres
 Age - 106
 Type - Mixed Oak
 TPA - 227
 AGS - 90 sq. ft.
 Stocking - 123%
 Growth Rate - <2%
 Soil Type - Weikert
 Site Index - 60
 Composition - WO- 35%
 CO- 26%



1 inch = 1,000 feet

0 250 500 1,000 1,500 Feet



Legend

- ManagedArea
- HarvestArea
- Wildlands
- OGEMA
- ESA
- HCVF
- GRSF Boundary

Silviculture Proposal Narrative

Proposal Name: Oldtown Orleans Rd

Managed Area: 66 Acres

Harvest Area: 41 Acres

Resource Impact Assessment

Forest Community Types and Development: This is a mixed oak stand within the general forest area. According to the GRSF specified 100 year rotation, this stand is over-mature at 115 years. Furthermore it is an overstocked stand. These facts constitute the selection of this stand for regeneration silviculture treatment.

Rare, Threatened and Endangered (RTE) species: There are no known RTE species currently on or impacted by this site.

Habitats and Species of Management Concern: There are no known habitats or species of management concern on this site.

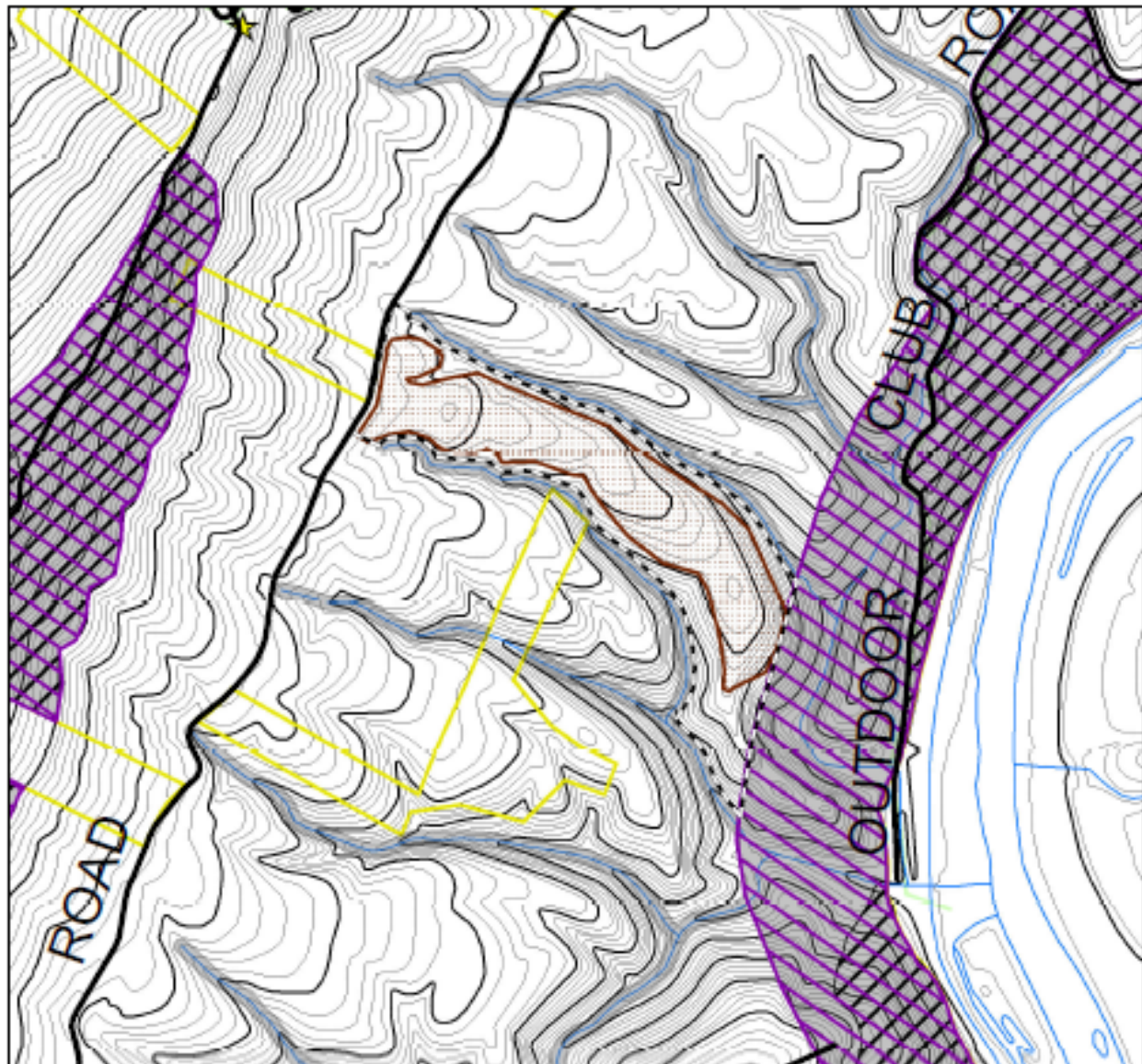
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HC VF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

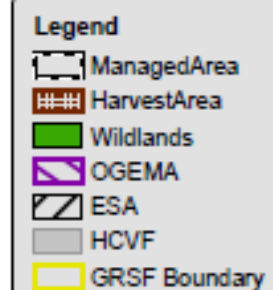
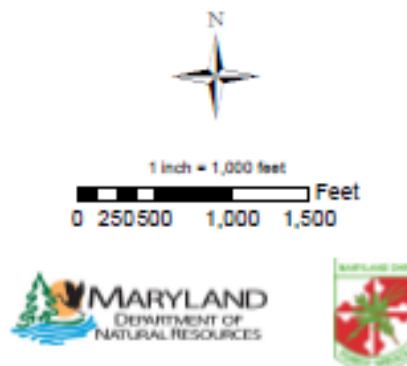
Historic Conditions: This stand like most of GRSF likely developed on its own over the past 115 years into what it is today despite the fact that it was commercially clearcut, and likely the ground was converted to fruit orchard in years prior to 115 years ago. Historically this site was likely dominated by American chestnut. However, chestnut blight has eliminated American chestnut from having a dominant position in the landscape.

Silvicultural Prescription: The recommendation for this stand is to regenerate the stand under the principles of variable retention. The objective is to achieve regeneration of a mixed oak stand while maintaining some attributes of the original stand for wildlife habitat, natural heritage, and aesthetics values.

FY-2017 Proposed Harvest Oldtown Orleans Rd



Compartment - 60
 Managed Area - 66 Acres
 Harvest Area - 41 Acres
 Age - 113
 Type - Mixed Oak
 TPA - 235
 AGS - 78 sq. ft.
 Stocking - 126%+
 Growth Rate - <2%
 Soil Type - Klinesville
 Site Index - 58
 Composition - CO- 27%
 WO- 24%



Silviculture Proposal Narrative

Proposal Name: Barnes Road

Managed Area: 42 Acres

Harvest Area: 42 Acres

Resource Impact Assessment

Forest Community Types and Development: This is a mixed oak stand within the general forest area.

Rare, Threatened and Endangered (RTE) species: There are no known RTE species currently on or impacted by this site.

Habitats and Species of Management Concern: There are no known habitats or species of management concern on this site.

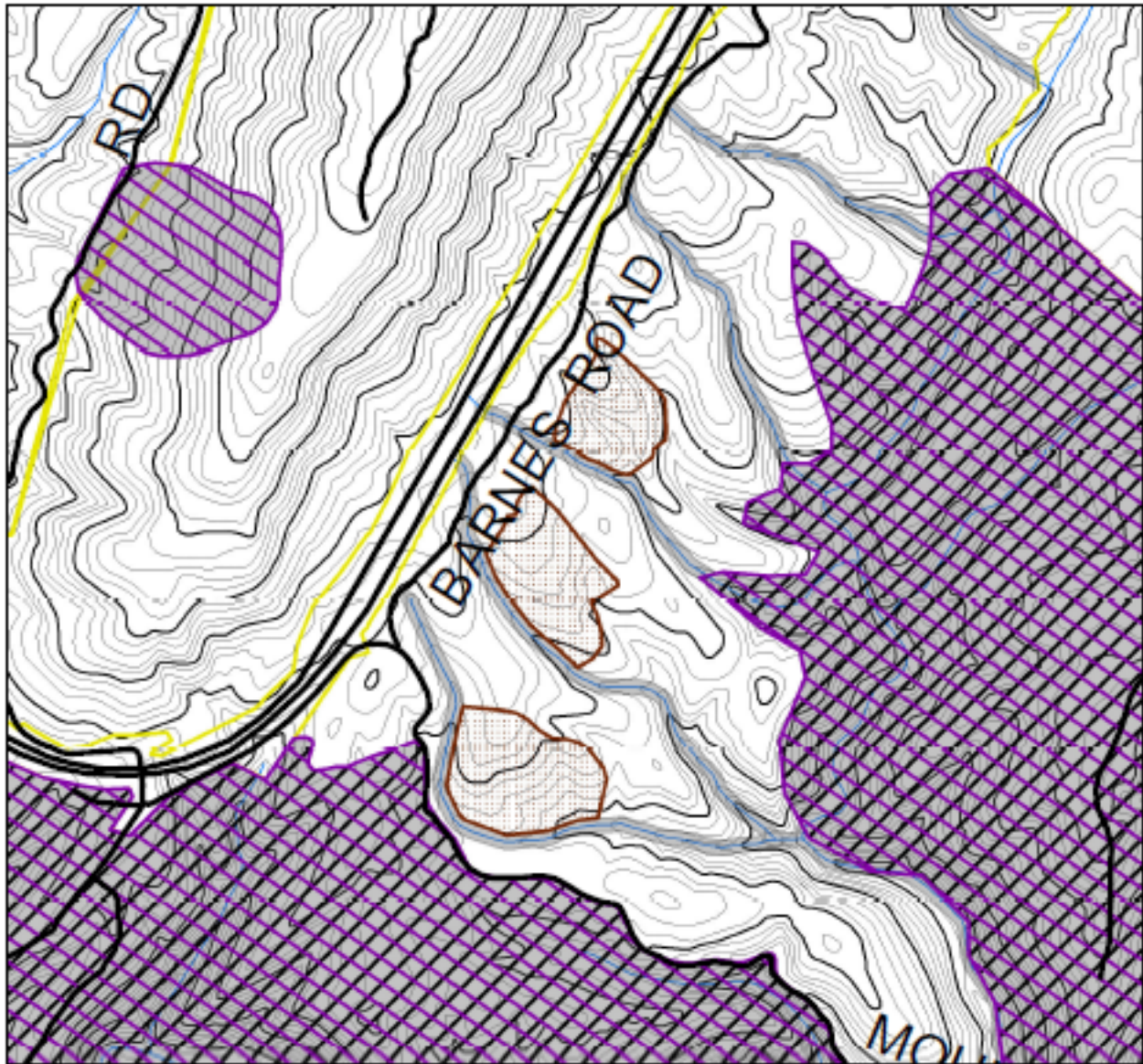
Water Resources: Water resources will be protected on this site. Access to the site is an existing road. All streams are already identified as HC VF and will be protected by a 50-foot wide no-cut forest buffer.

Soil Resources: Soil resources on this site will be protected under the *Maryland Department of Natural Resources-Forest Service: Rutting Guidelines for Forest Operations on Maryland State Forests*.

Historic Conditions: This stand like most of GRSF was likely clearcut and the ground was converted to fruit orchard over 100 years ago. Historically this site was likely dominated by American chestnut. However, chestnut blight has eliminated American chestnut from having a dominant position in the landscape. The stand was then commercially clearcut approximately 41 years ago and left to naturally regenerate into the stand it is today.

Silvicultural Prescription: The recommendation for this stand is to do a TSI Thinning and remove 65 sq. ft. of basal area to achieve B-level stocking. Red Maple and other undesirable species will be targeted for removal. Reducing the stocking will reduce stress and enhance growth of the residual stand of mixed oaks. Any snags and large cavity trees will be retained for wildlife habitat, natural heritage, and aesthetics values.

FY-2017 Proposed Harvest Barnes Rd



Compartment - 40
 Managed Area - 42 Acres
 Harvest Area - 42 Acres
 Age - 41
 Type - Mixed Oak
 TPA - 560
 AGS - 66 sq. ft.
 Stocking - 145%+
 Growth Rate - 2%
 Soil Type - Klinsville/Calvin
 Site Index - 63
 Composition - CO- 40%
 BO- 20%



1 inch = 1,000 feet

0 250 500 1,000 1,500 Feet



Legend

- ManagedArea
- HarvestArea
- Wildlands
- OGEMA
- ESA
- HCVF
- GRSF Boundary

WATERSHED IMPROVEMENT PROJECTS

Continue to establish and enhance riparian buffers along Town Creek with volunteer tree planting projects. Non invasive tree and shrub species will be planted to establish forest buffers and enhance wildlife habitat.

The recently acquired Slider Tract includes agricultural fields along Town Creek. Part of the management plan for this area will focus on Riparian Forest Buffer Establishment along Town Creek and tributaries within this tract.

SPECIAL WILDLIFE HABITAT PROJECTS

1. Continue Implementation of the Kirk Orchard, Anthony's Ridge, and Kasecamp Bottoms Special Wildlife Habitat Plans.
2. Continue Rotational mowing and brush management in approved grasslands and other wildlife openings.
3. Develop a Special Wildlife Habitat Plan for the newly acquired Slider Tract to focus on Early Succession wildlife habitat.
4. Enhance cerulean warbler habitat within the Pine Lick ESA through uneven-aged silviculture.

ECOSYSTEM RESTORATION PROJECTS

5. Work will continue to suppress ailanthus populations on the forest. Focus will be put on roadside populations and individuals found within harvest proposal areas. Research has shown that suppression of ailanthus is most successful when using basal bark or cut surface treatments prior to harvest.
6. Partner with DNR Heritage Division to implement ecosystem restoration practices for shale barrens on GRSF. This work will include vegetation management with herbicides and prescribed fire where practical.

Shale Barren Restoration in Green Ridge State Forest

Proposed Work Plan for State Fiscal Year 2016

Coordinated by:

Wayne Tyndall, State Restoration Ecologist
Natural Heritage Program, Wildlife and Heritage Service
Maryland Department of Natural Resources

Maryland shale barren (savanna) communities support a number of rare plant and insect taxa which are dependent upon high irradiance levels and sparse leaf litter cover. However, biodiversity conservation sites for shale barren species have been transitioning from savanna to woodland condition with excessive shade and a near-continuous surface layer of leaves. Based on extensive research at one of the barrens, and reconnaissance of many others, expansion of pignut hickory is primarily responsible for deteriorating habitat conditions as a result of fire exclusion and historical silvicultural practices. In addition, the fire-intolerant Virginia pine became established in high densities on some of the barrens and contributes to excessive shade and leaf litter. More recently, non-native invasive species have been expanding in most of these barrens, especially tree-of-heaven and Japanese barberry,

The goal of this project is to restore savanna conditions to all shale barrens in Green Ridge State Forest with the most diverse community type, identified by the dominant *Carex pensylvanica*. The primary annual objective is woody and non-native species management in 40 acres of barrens with this community. Since barrens are 1 to 5 acres in size, the total number of barrens managed during the fiscal year will be about 15. The second objective is prescribed burning of at least one barren, or complex of barrens, if site conditions allow for a safe fire.

Pignut hickory, Virginia pine, and tree-of-heaven will be treated using the drill-and-syringe technique (imazapyr active ingredient) to minimize non-target impacts. Trees will be left in place to avoid soil surface damage. Japanese barberry will be foliar sprayed with Garlon 3-A,

and steps will be taken to avoid exposure of any rare and endangered species. Other invasive species will be searched and managed as necessary.

Prescribed burning of the Pine Lick complex of shale barrens appears feasible given the presence of wide stream and roadway firebreaks. The complex is comprised of three barrens, ranging from 1 to 3 acres, embedded in an oak forest. To preclude negative impacts to rare species, and to be within the natural fire window, a fall (October-November) prescribed burn is planned.

MONITORING PROJECTS

1. MD DNR Fisheries will continue to monitor aquatic populations in Town Creek and the Potomac River. The Ridge and Valley Stream Keepers will also continue to monitor water quality in the streams within the region.
2. GRSF staff will monitor regeneration of stands by completing post harvest regeneration inventories on all final rotation harvests during 5th growing season.
3. MD DNR Wildlife & Heritage Division will continue to monitor 2 GRSF resident black bear sows and cubs that are collared and gps equipped.
4. MD DNR Wildlife & Heritage Service will continue to research and monitor T&E species on the forest including wood turtle, timber rattlesnake, and several lepidoptra species.
5. MD DNR Wildlife & Heritage Service will continue to monitor big game harvest on the State Forest via required hunter harvest check in system.
6. Wildlife Institute will monitor American Woodcock population in Kirk Orchard area with annual spring singing ground surveys.
7. GRSF staff will continue to monitor and document all timber operations within the forest on a weekly basis.
8. Maryland Department of Agriculture (MDA) will continue to monitor gypsy moth, hemlock wooly adelgid, and other insect pest populations on the forest.
9. MD DNR Wildlife & Heritage Service will continue to monitor whip-poor-will populations with annual spring nightjar survey.
10. MD DNR Wildlife & Heritage Service will coordinate monitoring of GWWA population with spring surveys.

Operational Management

1. Introduction

This section of the plan is designed to cover the annual cost and revenues associated with the operational management of Green Ridge State Forest. It is the Department's intent that most of the revenues generated from the GRSF will be used to pay for the management and operation of the Forest. As stated in Chapter 1 of this plan, *"The primary goal of the Green Ridge State Forest Sustainable Management Plan is to demonstrate that an environmentally sound, sustainably managed forest can contribute to local and regional economies while at the same time protecting significant or unique natural communities and elements of biological diversity."*

The numbers expressed in this section are only estimates and averages of annual expenses and revenues. These numbers will fluctuate each year based on management prescriptions, economic conditions and public use of the forest.

The following information is a breakdown on Revenues and Operational costs associated with the Green Ridge State Forest. These figures are only estimates that are based on projected revenues and operational expenses. Yearly changes in the timber markets and weather conditions can severely affect revenues. Also weather can greatly affect recreation revenue. Operational expenses will vary from year to year mainly based on costs associated with proposed projects. For many special projects other sources of revenues such as matching grants will be sought to help offset the cost to the Department.

2. Green Ridge State Forest Revenue

Estimated: \$225,000 to \$300,000

Revenues that are generated from the Green Ridge State Forest are deposited into the Department's Forest Reserve Fund. In order to cover expenses out of this Fund, a Green Ridge Forest Budget must be developed a year in advance as part of the larger DNR budget. It then goes through the legislative approval/review process along with all other state operating budgets. Once adopted, the budget goes into effect the first day of the fiscal year (July 1st).

Forest Product Sale Revenue: *Estimated: \$150,000 to \$175,000*

This revenue is generated from the sale of forest products, which are identified in the Annual Work Plan. Traditional forest products include pulpwood and sawtimber from intermediate and regeneration harvests. This revenue is tied to forest harvest activities identified in the annual work plan and will vary each year. With the current age class distribution of the forest most revenue will be from regeneration final harvest operations.

Recreation Revenue: *Estimated: \$75,000 to 125,000*

This revenue is generated from the sale of camping permits, fuel wood permits, and shooting range permits.

Other Revenue/Funding Sources

Annual Amounts vary, Estimated: \$NA

Other budgetary funding that is utilized on an annual basis in the management of Green Ridge State Forest comes from a variety of sources including the Forest or Park Reserve Fund and General Funds.

Grants

Annual Amounts vary, Estimated for FY-2017: \$30,000

Other funding comes in the form of grants through state and federal sources and are primarily utilized in recreation, habitat and watershed restoration projects. These funds are project specific. Some funding will be obtained through partnerships and grants, such as National Recreation Trail Grants funds. Expenses include the installation recreation improvements, removing invasive species and re-establishing native plant communities and habitat. This year GRSF has has applied for \$30,000 through the National Recreation Trail Grant program to fund labor for maintaining the Green Ridge Trail system.

3. OPERATIONAL COST:

Estimated total Annual Expenses: \$550,000

Operational expenses are those costs paid directly out of the GRSF operational budget by the State Forest Manager and vary based on approval of operational budgets. The Forest Manager prepares a proposed operational budget for the forest based on instructions provided approximately one year in advance of the fiscal year. The FY-2017 budget proposal was prepared in August of 2015.

Staffing Cost

Classified Salaries, Wages and Benefits, Estimated: \$261,810

This cost is associated with Departmental State Personnel classified salaries. This staff is responsible for developing and implementing annual work plans, managing the daily activities on the forest, including resource management, recreation program management, maintenance, and administration.

Contractual Staffing, Estimated: \$130,000

This cost is associated with contractual staffing associated with operations of the state forest. Contractual personnel are responsible for assisting classified personnel in conducting work outlined in the annual work plan, managing the daily activities on the forest, including boundary line work, maintenance of trails, forest roads, maintaining primitive campsites, a public shooting range, overlooks, wildlife habitat areas, and assist with implementing all maintenance, recreational, silviculture, and ecosystem restoration projects.

Land Operation Cost

Estimated: \$100,000

This includes expenses for office and field equipment, vehicles, gates, gravel, signs, boundary paint, roadwork contracts and construction, trash removal from illegal dumping, boundary line work & surveying, tree planting, site preparation, control of invasive species, pre-commercial thinning and other forest management practices. Some of these costs will vary greatly from year to year based on the activities identified in the Annual Work Plan.

Forest Certification, Inventory & Monitoring Program

Estimated: \$10,000

This estimate reflects the annual cost of various on-going inventory and research projects on the forest. Expenses are directly tied to Forest Certification. The purpose of forest monitoring is to accurately evaluate forest health and the effects of specific management activities. Resource managers will use the information to make informed future management decisions (i.e. adaptive management). Cost would cover both forest resource and sensitive habitat inventories and monitoring the effects of various restoration projects.

Expenses for forest certification will vary from year to year and will be at their highest at the initial certification and then every five years when the re-certification is done. Routine audits are used to verify compliance with the various certification programs. The goal is to certify Green Ridge State Forest under both the Sustainable Forest Initiative (SFI) and the Forest Stewardship Council (SFC). Each certifying agency takes a slightly different look at what is needed for sustainable forest management. Expenses will include fees for audits and annual monitoring programs for compliance with the certification requirements.

Future plans include hiring additional staffing to cover wildlife management activities, restoration projects, recreation management, monitoring, and additional forestry related activities outlined in this Sustainable Resource Management Plan for Green Ridge State Forest.

County Payments

Estimated: \$60,000

These are revenue payments to local county governments which will vary every year. Payments are made on an annual basis to Allegany County based on 25% of the gross revenue generated from GRSF. These payments come out of revenue generated from timber sales and recreation. These payments are used to help the counties offset the loss in property tax revenues which are not paid on state owned lands.

4. Summary

This is the general breakdown on Revenues and Operational Cost associated with the Green Ridge State Forest for FY-2016. As described, these figures will vary from year to year. This generalization of the operating budget suggests the importance of maintaining income levels in order to achieve the goals set forth in the other portions of this plan (i.e. sustainability).